

以濁水溪颱風洪過程探討定量流與變量 流模擬在臺灣之堤防高度設計適用性

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摘 要 迴水演算乃長久以來工程界用來設計堤防高度的工具。隨著電腦計算能力倍增及數值方法的改進，有學者主張以較精確的變量流模式來模擬洪水在河道中的傳遞以取代迴水演算的傳統方法。本文以濁水溪中下游河道水理特性為代表河流作為評估與瞭解在臺灣坡急流短的條件下，使用水理輸砂模式模擬天然河道時，擬似定量流與變量流模式模擬結果的差異，以作為工程界訂定設計準則之參考。由於流短坡急，洪峰的消滅由中游至下游並不明顯；單以堤高的設計而言，變量流模擬與擬似定量流模擬所得之堤高並無明顯差距。若以動床條件模擬，由於底床沖刷之故，洪峰水位將會降低。

關鍵詞：變量流、擬似定量流、數值模擬、堤防高程。

Adequacy of Quasi-Steady or Unsteady Flow Simulations for Design of Levee Height in Taiwan

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ABSTRACT Simulation comparisons were made between quasi-steady flow and unsteady flow formulations for a typical flood in Cho-Shui Creek, Taiwan. Fixed- or mobile-bed conditions are discussed separately. In the fixed-bed simulation, the only difference between quasi-steady and unsteady simulation with similar time increment is the time lag of flood peak. In mobile bed simulations, the hydraulic parameters between upstream and downstream tend to become more uniform and the elevation of flood peak decreases because of local erosion. Attenuation of flood peak is negligible due to flow characteristics in Taiwan such as steep slope and short travel distance. Quasi-steady flow simulation comes out with the same levee heights compared with the unsteady one. Effect of tide at the downstream on the design of a dike is also discussed.

Key Words: unsteady, quasi-steady, numerical simulation, levee.

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